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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/664,440	09/18/2003	Mitsuyuki Asaki	514802002600	4476

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EXAMINER
SMITH, JOHNNIE L

ART UNIT	PAPER NUMBER
2881	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/664,440	ASAKI ET AL.	
	Examiner	Art Unit	
	Johnnie L Smith II	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 August 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-8 and 12-13 are rejected under 35 U.S.C. 102(b) as being anticipated by US patent 5,659,172 (Wagner et al). In reference to claims 1-8 and 12, Wagner et al teaches a measuring apparatus for measuring pattern width of a pattern formed on a wafer using an electron beam, having an electron beam generating section, a deflector, a first secondary electron detector and a second secondary electron detector for detecting secondary electrons generated; a first and second edge detector for detecting position of a second edge of the pattern based on the quantity of the secondary electrons detected; and a pattern width computing section for computing pattern width of the pattern based on the position of the first edge and the position of the second edge detected by said first edge detector and said second edge detector (column 4 lines 13-24 and line 61-column 5 line 30, figures 1 and 6). Wagner teaches a measuring apparatus wherein said first edge

detector detects the position of the first edge which is located farther than the second edge from said first edge detector, and said second edge detector detects the position of the second edge which is located farther than the first edge from said second edge detector (figure 1 and 6).

3. In reference to claim 3 Wagner teaches a measuring apparatus wherein, said first edge detector detects irradiation position of the electron beam at which the quantity of the secondary electrons detected by said first secondary electron detector has a local minimum as the position of said first edge, and said second edge detector detects irradiation position of the electron beam at which the quantity of the secondary electrons detected by said second secondary electron detector has a local minimum as the position of said second edge (column 4 lines 13-38); wherein said first edge detector detects the irradiation position of the electron beam at which the quantity of the secondary electrons detected by said first secondary electron detector has a local minimum as a bottom edge, which is a bottom end of the first edge, said second edge detector detects the irradiation position of the electron beam at which he quantity of the secondary electrons detected by said second secondary electron detector has a local maximum as a top edge, which is a top end of the first edge, and said pattern width computing section further computes horizontal dimension of the first edge further based on the position of the

bottom edge and the position of the top edge detected by said first edge detector and said second edge detector, respectively (figure 1); further comprising a third edge detector for detecting the position of the first edge and the second edge based on sum of the quantity or at which derivative of the sum of the secondary electrons detected by said first secondary electron detector and the quantity of the secondary electrons detected by said second secondary electron detector (column 5 lines 15-30). Having the said third detector is an inherent limitation since Wagner discloses the ability of having multiple detectors (column 4 lines 39-43).

4. In reference to claim 12, Wagner teaches a method measuring pattern width of a pattern formed on a wafer using an electron beam, having steps of generating the electron beam; scanning the pattern with the electron beam; detecting secondary electrons by the first secondary electron detector and the second secondary electron detector, the secondary electrons being generated when the electron beam is irradiated on the wafer or the pattern; detecting position of a first edge of the pattern based on the quantity the secondary electrons detected by the first secondary electron detector out of the first secondary electron detector and the second secondary electron detector; detecting position of a second edge of the pattern based on the quantity of the secondary electrons detected by the second secondary electron detector out of the first secondary electron detector and the

second secondary electron detector; and computing pattern width of the pattern based on the position of the first edge and the position of the second edge detected by said first edge detecting step and said second edge detecting step (column 4 lines 13-24 and line 61-column 5 line 30, figures 1 and 6).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over US patent 5,659,172 (Wagner et al) in view of US patent 6,172,363 (Shinada et al).

Wagner teaches and discloses all elements of the claim upon which these claims depend including the limitation of said detectors being oppositely disposed (figure 1). Wagner fails to clearly show a measuring apparatus having an objective lens for focusing the electron beam below the said detectors. Such a limitation is shown in the disclosure of Shinada (column 13 lines 10-13). Since having an objective lens is notoriously old in the art, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the lens teachings of Shinada with the apparatus of Wagner for the purpose of spreading the transmitted electron beam to a diameter suitable for detection.

Response to Arguments

7. Applicant's arguments filed 08/09/2004 have been fully considered but they are not persuasive. Applicant argues that Wagner does not disclose determining pattern width based on local minima of electrons detected and that Wagner fails to disclose computing a pattern width based on the position of the first local minimum and the position of the second local minimum detected by said first edge detector and said second edge detector. In the reference of Wagner (column 6 line 38- column 8 lines 27), Wagner teaches the steps by which local minima are calculated. Accordingly, Wagner anticipates the claims.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johnnie L Smith II whose telephone number is 571-272-2481. The examiner can normally be reached on Monday-Thursday 7-4 P.M. and Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 571-272-2477. The fax

phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JLSII

Johnnie L Smith II
Examiner
Art Unit 2881

JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800